rather than marginal costs are used. Since average costs exceed marginal costs, a deficit will be created for the cellular carriers' operations which will need to be made up through higher prices for the "radio elements" of the carriers operations.

The CSI proposal also does not correctly treat economies of scope. For functions currently provided by the carrier's MTSO, the reseller switch will increase costs to cellular carriers who will be required to provide the services for the reseller switch. The CSI proposal takes no account of these cost differences which arise from economies of scope, but rather assumes that the cost of providing cellular services will be identical for the carriers' own networks and for the reseller switch. The CSI proposal would again lead to a loss of economic efficiency and to higher prices for consumers since cellular carriers' costs (aside from LEC interconnection costs) will not decrease by as much as their revenues because the costs of servicing the reseller switch will be higher.[5] Thus, the CSI proposal incorrectly treats both economies of scale and economies of scope because it is based on average (instead of marginal) costs of the cellular carrier. The marginal cost is the difference between carrier provision of the entire wholesale service compared to provision of part of the service by the carrier and the remainder provided by the reseller switch, and properly reflects the costs which are caused by accommodating the reseller switch.

9. Q. Your criticism of the CSI proposal of Mr. King identifies the use of average rather than incremental cost as incorrect. Do other problems exist with the use of an average cost approach?

A. Yes, the method used by Mr. King to calculate average cost corresponds to a fully distributed cost (FDC) approach. As almost all professional economists have agreed, an FDC approach is inherently arbitrary and bears no

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[5] Obviously, the carrier will avoid landline interconnection costs, but from the perspective of the consumer there is no cost saving since the reseller will simply take over paying these costs.

relationship to the goal of economic efficiency.[6] The essential mistake in Mr. King's approach, as with all FDC approaches, is that he attempts to apportion the fixed and common costs, e.g. the MTSO, based on arbitrary allocation factors which are not based on cost causation. Since the MTSO does a number of operations such as providing hand off capability, switching calls to the landline network, and maintaining billing information, its processor and memory provide inputs to many jointly done functions. When multiple outputs are produced incremental cost, i.e. the cost of increasing (or decreasing) a given operation is well-defined, but an average cost of each operation is not well-defined because of the necessity of allocating the joint and common costs.

A simple example may be useful here to show the difference between fully distributed cost and incremental cost. At MIT I have a desktop personal computer (PC) which is hooked up to a Laser Jet printer. The PC software allows me to run computer programs and to print simultaneously. Now assume that my department chairman is considering setting up a network to share printers, but he faces the problem of deciding what my current cost of printing is. The cost of the printer is easy to assign to printing because it is used for only a single task. But how much, if any, of the cost of the memory in my PC should be assigned to printing? The memory is used for both processing programs and for printing. An FDC allocation of memory based on some factor, e.g. the clock time per day that I am printing divided by total time the computer is turned on, is clearly arbitrary and probably bears little or no relationship to the correct cost causation measure. But, incremental cost is well defined. It is the cost difference between my PC memory configured for the printer network and my PC memory configured to do stand alone printing. There is probably very little cost difference. (Similarly, avoided cost would consider what costs of my current PC would be eliminated by

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[6] See e.g. S.J. Brown and D.S. Sibley, The Theory of Public Utility Pricing, (Cambridge University Press, 1986, p. 60) who state, "Although FDC pricing has no claim to economic efficiency and is to a large degree arbitrary..."

the printer network.) Thus, fully distributed costs are always incorrect; cost causation measurements require an incremental or avoided cost approach when attempting to measure competitive price responses.

10. Q. You state that Mr. King uses an FDC approach in his estimation of "landline" costs of the cellular carriers. Can you provide examples of his FDC methodology?

A. Yes, many such examples exist in Mr. King's attachments. I first consider his investment allocations (e.g. Attachment A, Worksheet 1.1).

(1) Mr. King assigns 50% of the switching investment (line 4) to his "radio" category and 50% to his "landline" category. This arbitrary allocation attempts to divide the common cost of the MTSO into two parts, but the allocation is not based on any underlying economic principles of cost causation.

(2) Mr. King then takes the arbitrary amount of switching "used" by the landline category and divides it by the sum of switching, base controller, and radio channels to allocate the power investment category (Line 3). Since the allocation is based on an arbitrary FDC allocation, the result is arbitrary also.

(3) For the other investment categories, buildings (line 1), leasehold improvements (line 2), and tools and equipment (line 7), Mr. King then adds together the switching and power costs and divides by total investment cost to get a ration factor for these categories. Again the FDC allocations are totally arbitrary.

Indeed, it is straightforward to demonstrate that Mr. King's entire investment allocation calculation depends entirely on the arbitrary 50% allocation for switching. For instance, if the 50% factor were instead 25%, the costs allocated to his landline category would be 1/2 as great, and so on. Clearly, to find that allocation of categories such as buildings and leasehold improvements is <u>entirely determined</u> by the arbitrary allocation of switching investment demonstrates how arbitrary FDC and Mr. King's procedures are.

Next, I consider Mr. King's allocation of operating expenses (e.g. Attachment A, Worksheet 1.2).

(1) For the maintenance (line 1), depreciation (line 2), and other operating categories (line 5), Mr. King's allocation is driven entirely by his initial arbitrary assignment of the 50% factor for switching investment which I described above. That building maintenance costs are calculated using an arbitrary allocation of switching investment again demonstrates the arbitrary nature of FDC allocations.

(2) Mr. King allocates operating costs of customer accounts between his radio category and landline category using an arbitrary factor of 33% for the landline category. Again, this factor is completely arbitrary.

(3) Mr. King then allocates G&A expenses based on his estimates of the other categories of operating cost, which are in turn based on the arbitrary 50% assumption for switching investment and the 33% assumption for customer accounts.[7] This allocation of G&A expenses is an example of attribution of common cost by the attributable cost method (ACM) which is a common approach to FDC allocations.[8]

Lastly, I consider Mr. King's estimates of operations income, usage rates, and wholesale operations return (e.g. Attachment A, Worksheets 1.3-1.5).

(1) Mr. King attributes 30% of revenues to access charges and 70% to operations. This estimate is arbitrary, but even more importantly is not cost based since prices (and revenues) depend on demand conditions as well as cost conditions. Thus Mr. King's use of this number to estimate "usage revenues (Worksheet 1.3, line 2) which he later uses to

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[7] Mr. King uses an additional arbitrary assumption of the cost per radio channel frequency in his calculations.

[8] See e.g. Brown and Sibley, op. cit. p. 45 or R.R., "An Analysis of Fully Distributed Cost Pricing in Regulated Industries," Bell Journal of Economics, 11, 1980.

derive his proposed tariff is arbitrary and not based on correct economic considerations.

(2) When Mr. King then takes the current wholesale tariffs (e.g. Worksheet 1.4) and divides them into a radio category and landline category he uses his landline investment calculation (which is entirely based on the arbitrary 50% switching assumption), the income calculation (which is based on the arbitrary 30-70% split of revenues and the arbitrary 50% switching assumption), and the operating expenses category (based on the 50% switching assumption and the 33% customer accounts assumption).[9]

Thus, each category is based on arbitrary FDC assumptions so that the final calculated tariffs are also completely arbitrary. As I have testified before, fully distributed cost has universally and properly been rejected as a basis for public utility pricing. The Commission would be required to renounce its goal of economic efficiency if it adopted the FDC approach put forward by Mr. King and CSI.

MONTHLY ACCESS REVENUES PARTLY COVER THE FIXED COSTS OF THE CELLULAR NETWORK WHICH WILL NOT BE ELIMINATED BY A RESELLER SWITCH

11. In your discussion of Mr. King's allocation of operating income, you stated that assignment of revenues from access and revenues from

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[9] Yet another problem exists with Mr. King's methodology. When he applies his rate of return to a carrier's "rate base", he uses traditional rate of return accounting methods on average net plant (e.g. Attachment A, Worksheet 2.5) which use a historic investment basis for plant in use. For instance, for the Los Angeles Limited Partnership (PacTel) he omits over $39MM in retirements during the 1989 year. (LA SMSA Limited Partnership, Year Ended Dec. 31, 1989, p. 15) These retirements are caused by investment in improved switching equipment and radio frequency channel equipment. Note that these retirements occurred before PacTel was in operation for even five years, well before the equipment was fully depreciated. Use of traditional rate of return accounting methods will give a misleading calculation in a dynamic industry such as cellular where new and improved equipment is put into service replacing less technologically advanced equipment.

operations is incorrect because the allocation is based on an arbitrary factor. Is Mr. King's treatment of access incorrect in other respects?

A. Yes, his approach is incorrect because Mr. King proposes to eliminate monthly access revenues to the carriers from CSI customers. In his proposed Cellular Tariffs for the cellular carriers (e.g. Attachment A for LACTC, Schedule Cal. PUC-T) no monthly access charge is included. This approach is simply wrong.[10] Cellular networks, as with all telecommunications networks, have a large proportion of fixed (or sunk) costs as a proportion of total costs, c.f. my earlier Phase II testimony (p. 16). As I stated there, "A rule of setting price equal to marginal cost would lead to large economic losses and a lack of economic viability for a cellular carrier." In this type of situation, it is common for a telecommunications provider to recover its fixed costs and its variable costs by a combination of a monthly access charge and a per minute usage fee. For instance, Pacific Bell and other LECs utilize this type of tariff for both exchange access and for IXC access which uses a monthly subscriber line charge (SLC) plus a per minute charge. Typically, the proportion of costs recovered from the monthly access charge compared to the per minute usage charge depends on the ratio of fixed to variable costs, but it also depends on demand conditions and the degree of competition in the market. The fixed costs must be recovered for the cellular provider to remain economically viable, and much of the fixed costs are not eliminated when a customer switches to a reseller switch. Thus, contrary to the CSI proposal put forward by Mr. King the carrier monthly access charge cannot be eliminated.

12. Does the fixed cost and access factors affect the network configuration proposal of Mr. Widmar (Dual-system access, p. 4), Mr. Raney (pp. 3-4), and Mr. Midgley (Figure 1, p. 1A)?

A. Yes, the CSI interconnection proposal as put forward by each of these

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[10] The only revenue allowed by Mr. King for the carriers that is not usage-based is a one-time charge for each T-1 trunk.

individuals has the CSI reseller switch connected to both carriers' MTSOs. Because the CSI proposal envisions the reseller switch using either carrier's switch interchangeably, the fixed costs of each carrier will increase compared to the current situation where each carrier knows its number of customers and can forecast its traffic load with some degree of certainty. Because a cellular carrier will not know how CSI's use of its MTSO and radio component of their network will fluctuate over time, carriers will be required to build enough capacity to handle all reseller customers in order to maintain service quality standards at current usage levels. The extra capacity will lead to higher costs to society for the provision of cellular service, and it will also likely lead to higher access tariffs (holding other factors equal) for cellular customers.

A RESELLER SWITCH MAY LEAD TO HIGHER PRICES TO CONSUMERS AND RETARD FUTURE TECHNOLOGICAL ADVANCEMENT

13. Q. Will these higher costs affect prices to retail customers?
A. Yes, in markets where prices are determined by competition as in cellular markets, higher costs typically lead to higher prices. CSI witnesses have claimed that costs to cellular carriers will be lower than at the present time given a reseller switch. This comparison is incorrect since in competitive markets economic efficiency and prices will depend on the total cost of provision of cellular service including the carriers costs' and the reseller switch costs. Unless the reseller switch is markedly more efficient at performing the "landline functions" than the carriers' current switches, which seems highly unlikely, total system costs will increase with the installation of a reseller switch. Furthermore, the essential economic feature of competition in cellular markets which creates imperfect competition--the presence of two carriers in each market--will not change with the operation of a reseller switch. Thus, contrary to DRA contentions that a reseller switch would lead to lower prices, these higher costs may well lead to higher prices

for retail customers.[11] An important economic point of the CSI proposal is that it will raise overall cellular costs--it does not provide a "free lunch" to cellular customers. These higher costs will need to be reflected in higher prices by the cellular carriers, but the CSI proposal takes no account of the impact of higher costs upon prices.

14. Q. Does the CSI proposal balance risk and return appropriately? A. No, the CSI proposal attempts to share in the earnings of successful investments by the cellular carriers with little risk to themselves. In my view the CSI proposal is an example of rent seeking behavior which is far different from the competitive developments in other areas of telecommunications which Mr. King reviews in his testimony. (pp. 13-16) In each of those situations competition was permitted in a previous monopoly situation where the monopoly provider faced relatively little competition and little economic risk. Thus, the monopoly provider had close to a guaranteed return which was the basis of rate of return regulation. Cellular differs in at least two important respects. First, no one ever guaranteed cellular

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[11] See March 22, 1991 letter from DRA to Ms. Donna Wagoner of the CACD, p. 1. The mistake in the DRA's economic reasoning can be explained by the following simple example. Assume that the FCC had licensed only a single cellular carrier in each CMSA and that carriers were unregulated. If a reseller switch increased the monopolist's costs, its price would also increase. Increased "downstream" competition does not affect the monopolist's markup of price over cost since only the final price elasticity of demand from retail customers (which has not changed) determines the markup. Under imperfect competition as in the duopoly situation, economic theory cannot make an exact prediction on the direction of the change in prices. However, increased costs typically have the effect of increased prices absent rate of return type regulation in a previous monopoly situation. Even the DRA recognizes that an important question is whether the reseller switch proposal can be "accomplished economically." (ibid., p. 2) Thus, the DRA's question on the economic feasibility seems at odds with its their contention that lower prices will necessarily result.

carriers a rate of return on their investment.[12] Indeed, cellular carriers took considerable risk in constructing their networks, and early on (about 1985) many commentators predicted that cellular would never be that successful.[13] Even today, the implicit risk built into the stock market prices of cellular companies is 2-3 times higher than for LECs or for AT&T. Second, cellular carriers are not a monopoly; they are a duopoly in which no one, in any area of the entire U.S., has ever demonstrated collusive behavior. Thus, Mr. King's reference to the "unbundling of the monopolist's rate structure on a cost-supported basis" (p. 15) is simply inappropriate since there is no monopoly in the provision of cellular service. Mr. King claims that a duopoly is "hence [a] largely non-competitive" market (p. 5), but he has no basis in economic theory or in the actual facts of California cellular markets to support his statement.[14]

The FCC established the ground rules for competition in cellular telephone, and carriers made their investment decisions accordingly. The FCC is now allowing for increased competition in mobile telecommunications with its Fleet Call decision and through future entry of personal communications systems (PCS). Resellers are certainly free to bid for SMR systems or to build PCS networks in the future. If they are successful, they will receive the rewards for their risks. But here resellers ask for a share of the cellular carriers earnings using a "back door" form of rate of return

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[12] The Decision found cellular risk to be substantially different from the monopoly telecommunications market. (D.90-06-025, Finding 82, p. 99) Also, the Decision found that unlike monopoly LECs, cellular carriers have no captive market of monopoly ratepayers. (Finding 87, p. 100)

[13] The market value of cellular franchises at that time was about $10-12 dollars per pop (person in the relevant CMSA); the current price is 20-30 times higher.

[14] The Decision found that the record does not substantiate that cellular carriers are earning an excessive return on their investment. (Conclusion 20, p. 105)

regulation.[15]

15. Q. Will a reseller switch affect incentive for future technological advance in mobile telecommunications?
A. While the economic tradeoffs on a static basis between claimed increased future innovation by resellers and the higher cost which will be caused by a reseller switch cannot be quantified with any degree of certainty, a Commission decision in favor of the CSI proposal could certainly dampen incentives for future development of mobile telecommunications in California. Thus, the Commission's "vital goal" (Decision, p. 17) of incentives for technological advancement would be compromised. Assume I am a possible PCS provider who in 1992 is deciding whether to construct a network. I will face considerable risk with no guarantee of a successful return. However, if it turns out my network is successful, should I expect the resellers to appear again and ask for a share of my earnings since I can be hooked up to the reseller switch? Economic studies have demonstrated numerous times that investment in new products is strongly influenced by prospective return, and the CSI proposal is basically a proposal to share in the return of successful projects without taking the risk of investment in projects which may well turn out to be unsuccessful.

16. Q. Will the CSI proposal have an impact on the cellular industry and the regulation of the industry if the FCC grants PCS licenses?
A. Yes. The CSI proposal will have an adverse impact on the cellular industry for the likely forthcoming competition between cellular and PCS technologies. Cellular telephone will be made less competitive because of an uneconomic added layer of costs that a reseller switch will create. Regulators will be left with the difficult task of trying to balance the

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[15] Mr. King and the CSI have repeatedly asked for "cost based" tariffs and their proposal is a form of rate of return regulation. Please see Appendix A for references to these previous statements.

interests of carriers, resellers, new PCS carriers, and consumers in the face of the cellular industry being saddled with an inefficient cost structure and inefficient regulation. Thus, increased costs will harm consumers now and will harm competition in the future because of a less efficient cellular industry.

THE CSI PROPOSAL DOES NOT REFLECT MARKET REALITIES FOR CELLULAR SERVICE

17. Q. Is the CSI proposal for pricing practical given market realities in cellular telephone?

A. No, the CSI proposal has precisely the defects that I discussed in my testimony in Phase II of the OII. I stated:

> "Whatever type of regulatory oversight is adopted, it is essential that cellular markets be considered as the appropriate framework of analysis, not the individual carriers in the markets. The two carriers directly compete in each market, and any regulatory framework which does not recognize this essential economic fact will be seriously flawed....Thus, price or price bands set on an individual carrier basis will not recognize adequately the essential nature of this competition." (Statement of Professor Jerry A. Hausman, p. 25)

The CSI proposal, since it is rate of return type regulation based on the costs and return of each carrier, leads to significantly different prices for the competing carriers in the same cellular markets, e.g. Mr. King's proposal has a 14% difference in peak period rates in Los Angeles between the two carriers despite an assumed equal rate of return. Real competitive markets do not behave in this manner because when two products are very close substitutes their prices will be very close also. Only a misguided regulatory proposal would attempt to keep them far apart and will lead to large shifts of customers and resulting economic inefficiency as one system becomes much more highly utilized than the other system. Thus, as I stated in my testimony in the OII, rate of return regulation is very ill-suited for competitive markets.

The CSI proposal of "back door" rate of return regulation ignores competitive realities and creates the type of problems which I discussed in my previous testimony.

18. Q. Earlier, CSI and Mr. King recommended rate of return regulation as a necessary requirement to make the reseller switch a viable proposition.[16] Have they changed their views?

A. Mr. King continues to offer rate of return regulation as one alternative. However, probably recognizing that his proposition would require the Commission to reverse its nearly three years of work and change its order that rate of return regulation is inappropriate in the cellular industry, he now proposes an additional alternative.[17] The general purpose of the new alternative remains the same: an economically inefficient transfer of revenues from the carriers to the resellers. The transfer proposed by Mr. King is misguided because it is the carriers who have taken the risk of the investment in the cellular systems and the return for that investment is appropriately left with the carriers, as the Commission recognized in its Phases I and II order. It will result in economic inefficiency because it is an alternative revenue sharing scheme that is dependent upon inflated costs designed to create a protectionist price umbrella, leading to higher consumer prices in what otherwise would be competitive retail market. As I testified in my appearance in the first part of the Phase III hearings on the cost allocation methodology, this is precisely the behavior one would expect from competitors in a competitive market seeking to use the regulatory process for inefficient protection.

19. Q. Does the CSI proposal increase competition in the cellular

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[16] Please see Appendix A for references to CSI's and Mr. King's previous statements on this topic.

[17] Please see Appendix B for reference to these previous Commission statements.

industry?

A. The CSI proposal is unlikely to increase competition. The proposal puts an inefficient cost structure in place that will be difficult to regulate for years to come because it introduces cost based (and rate of return) regulation into a competitive industry. The likely outcomes of the CSI proposal are:

(1) Costs and prices are likely to be higher. Economic efficiency will decrease.

(2) According to engineering analysis, the cellular systems will be less reliable. (See Mr. Chessher's testimony)

(3) Future advances in technology and risk taking will be hampered.

(4) The proposal provides more for an increase in regulation than an increase in competition. The reseller switch proposal is yet another attempt at cost based and rate of return regulation, not increased competition in cellular telephone.

20. Q. Does this complete your testimony?

A. Yes.

APPENDIX A

THE RESELLER SWITCH CONCEPT IS DEPENDENT ON COST-BASED WHOLESALE RATES

CSI Phase II Opening Comments:

1. "CSI's proposal only makes economic and competitive sense if wholesale cellular carriers are required to unbundle the basic service elements of wholesale cellular service and offer such service elements at cost-based nondiscriminatory tariffed rates to switch-based resellers." p. 1.

2. "To derive a cost-based nondiscriminatory unbundled wholesale cellular tariff, airtime can be weighted as a function of the cost of construction as well as standard utility reasonable rate of return on the investment by the FCC-licensed cellular exchange carrier in its tower site and equipment." pp. 4-5.

3. "CSI requests that the Commission direct McCaw and other FCC-licensed cellular exchange carriers to implement these principles in a cost-based, nondiscriminatory unbundled wholesale tariff." p. 7.

4. "Additionally, under CSI's proposed plans, switch-based cellular resellers should be also able to purchase Type II interconnection from the LECs as well as cost-based tariffed interconnection arrangements with cellular carrier, equivalent to those carriers' interconnection with LECs so that all cellular exchange carriers--both resellers and FCC-licensed cellular carriers--can provide economical networks to their users." p. 10.

5. "[A]dditional interconnection issues concern the networks constructed by FCC-licensed facilities-based cellular carriers to which resellers do not presently have cost-based nondiscriminatory tariffed access." p. 12.

6. "Certainly, the identification of the basic service elements of a cellular system could be determined by analyzing the cost of cellular base stations, the cost of switching of cellular channels along with the proper allocation of general and administrative cost expenses to the wholesale and retail divisions of the facilities-based carriers. Based on this information, a cost based nondiscriminatory tariff could be formulated." pp. 12-13.

CSI Phase II Reply Comments:

7. "As a result, DRA recommends, and CSI concurs, that a cost-based unbundled nondiscriminatory tariff would allow for purchase of Basic Service Elements by switch-based resellers, which, in turn,

can provide enhanced services in competition with the FCC-licensed facilities-based cellular carrier." p. 4.

8. "By way of example, the following enhanced services could be provided by a switch-based reseller, if a cost-based nondiscriminatory wholesale tariff was required." p. 4.

9. "Thus, CSI requests that the Commission formally approve all elements of its switched-based certificated reseller proposal and unbundle the wholesale tariffs of the FCC-licensed carriers at cost-based rates and on nondiscriminatory terms and conditions." p. 5.

CSI Phase III Opening Comments:

10. "The concept of a reseller switch poses no technical problems, as demonstrated by the multiple switches already in operation in the larger MSAs in California. The primary unresolved issue relates to pricing. The only service that the reseller must obtain from the cellular carrier is radio channel access. By and large, most of the service elements bundled into cellular carriers' wholesale tariffs are not required by a reseller operating its own switch." p. 5.

11. "The price of basic service elements of a cellular system can be identified by analyzing the cost of cellular base stations, the cost of switching, and the cost of administering the wholesale and retail divisions of the facilities-based carriers. * * * Based on this information, a cost-based, unbundled, nondiscriminatory wholesale tariff with a reasonable rate of return for the cellular carrier could be formulated." pp. 7-8.

APPENDIX B

IN PHASE I AND II THE COMMISSION REJECTED COST-BASED WHOLESALE RATES FOR CELLULAR SERVICE AS INCONSISTENT WITH BASIC COMMISSION REGULATORY GOALS

The Commission reviewed an entire range of regulatory options and concluded in Decision 90-06-025 that cost-based regulation would be inappropriate and would retard the rapid expansion of service and use of new technology in this developing and competitive industry.

(i) "[C]ost of service regulation of wholesale prices is problematic in a competitive industry like cellular that is undergoing rapid technological change." p. 15.

(ii) "D.89-10-031 articulated at some length our finding that technological innovation and cost cutting are hindered by such regulation." pp. 15-16.

(iii) "The competitive duopoly market structure introduces other complications that would make it even more difficult [than it is in monopoly markets] to achieve efficiency through cost of service regulation." p. 16

(iv) "Carriers differ in their numbers of customers, precise service areas, equipment, and in numerous other characteristics that affect costs. We would be faced with setting different prices or different allowed rates of return; the former would artificially bias the market towards one carrier while the latter could be attacked on fairness grounds." p. 16; see also, pp. 93-94 (Findings 17, 18).

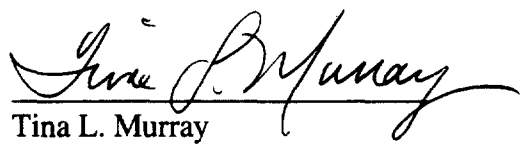
(v) "Keeping in mind the intent to promote competition for a discretionary service [such as cellular], rates should continue to be based on the market." p. 59.

(vi) "In the cellular industry, there is no bottleneck monopoly, this is a discretionary service, and technological change and service expansion are key issues." p. 59.

(vii) "The direct control of cellular prices through cost of service or rate of return regulation is inconsistent with the most important regulatory goals of promoting technological advancement, the expansion of service, and economic efficiency." p. 100 (Finding 90).

CERTIFICATE OF SERVICE

I, Tina L. Murray, hereby certify that copies of the foregoing Reply Comments were served by first-class mail, postage prepaid, this 13th day of October, 1994 on the parties listed on the attached service list.



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